

REMARKS

Receipt of the Office action dated January 30, 2004, is acknowledged. Claims 1-34 are pending in the present application. Claims 1-12 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Kanzaki, U.S. Pat. 6,006,706 (Kanzaki). Claims 13-16 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Tamura et al., U.S. Pat. 6,101,998 (Tamura). Claims 17-24 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Nakamura et al., U.S. Pat. 6,020,651 (Nakamura). Claims 25-34 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Hu, U.S. Pat. 5,839,453 (Hu). In keeping with the foregoing amendments and the following arguments, allowance of the rejected claims is respectfully requested.

Claims 1-12 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Kanzaki. Applicants have amended claim 1 to now recite a fluidically driven actuator adapted to open the valve, the fluidically driven actuator externally disposed relative to the mechanically driven actuator, the fluidically driven actuator coupled to a high pressure hydraulic fluid source and a low pressure hydraulic fluid source. In contrast, Kanzaki fails to disclose or even suggest the recited fluidically driven actuator.

Kanzaki is directed to a mechanism for controlling valve lift. Referring to FIGS. 1 and 2 of Kanzaki, the rocker arm 8 includes hydraulic fluid passageways 35 and 36 that provide high pressure hydraulic fluid from a pump 13 to a reservoir 32. A check valve 30 connects the reservoir to a high-pressure chamber 33, all of which are disposed inside the rocker arm 8. To increase valve lift, the pump 13 provides high pressure hydraulic fluid to the chamber 33. The check valve 30 prevents draining of the chamber 33. When increased valve lift is not desired, the supply of high pressure hydraulic fluid is cut from the chamber

33, and the chamber 33 drains through the discharge orifice 25. The mechanism of Kanzaki is entirely housed in the rocker arm 8.

In contrast to the fluidically driven actuator of the present device as recited in claim 1, Kanzaki does not disclose or even suggest a fluidically driven actuator that is externally disposed relative to the mechanically driven actuator. Additionally, Kanzaki does not disclose or even suggest a fluidically driven actuator that is coupled to a high pressure hydraulic fluid source and a low pressure hydraulic fluid source. Therefore, because Kanzaki does not disclose or even suggest every element recited in claim 1, rejection of claim 1, and dependent claims 2-12, under §102(b) based on Kanzaki should be withdrawn.¹

Claims 13-16 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Tamura. Applicants traverse this rejection. Claim 13 recites an actuator cylinder having a fluid passage and an actuator piston reciprocatingly disposed in the actuator cylinder.

Additionally, claim 13 recites a control valve operatively associated with the actuator cylinder, said control valve having a housing, and the housing receiving low pressure fluid from a low pressure fluid inlet and receiving high pressure fluid from a high pressure fluid inlet, said housing having a fluid outlet. Tamura fails to disclose or even suggest any such elements.

Tamura is directed to a fuel injection system. Referring to FIG. 3 of Tamura, fuel from the fuel tank 50 is delivered to a fuel injection valve 4 by a fuel pump 55. Prior to delivering the fuel to the injector 4, a first pressure regulator 54 and a second pressure regulator 59 regulate the pressure of the fuel directed to the fuel injector 4 from the fuel pump 55.

¹ “Anticipation under 35 U.S.C. § 102(b) requires the disclosure in a single piece of prior art of each and every limitation of a claimed invention.” *Rockwell International Corp. v. United States*, 47 USPQ2d 1027 (Fed. Cir. 1998).

Accordingly, Tamura fails to disclose or even suggest an actuator cylinder having a fluid passage and an actuator piston reciprocatingly disposed in the actuator cylinder. The Examiner has asserted in the Office action that Tamura discloses in FIG. 3 and at column 9, lines 16-19, an actuator cylinder 4 and an actuator piston disposed in the actuator cylinder 4. The component shown in FIG. 3 with reference numeral 4 is the fuel injection valve 4. Additionally, the fuel injection valve 4 receives high pressure fuel from the fuel pump 55 after the fuel pressure has been regulated by the pressure regulators 54 and 59. Therefore, neither the fuel injection valve 4 nor any other component of the system of Tamura receives low pressure fluid from a low pressure fluid inlet and receives high pressure fluid from a high pressure fluid inlet.

Because Tamura fails to disclose or even suggest any one of: an actuator cylinder having a fluid passage and an actuator piston reciprocatingly disposed in the actuator cylinder; and, a housing that receives low pressure fluid from a low pressure fluid inlet and receives high pressure fluid from a high pressure fluid inlet, said housing having a fluid outlet, claim 13 and claims 14-16 are patentable over Tamura. Therefore, the rejection of claims 14-16 should be withdrawn.

Claims 17-24 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Nakamura. Applicants traverse this rejection.

Claim 17 recites "a valve reciprocatingly disposed in a port extending from the engine cylinder, a first valve actuator adapted to open the valve; ... and a second valve actuator adapted to be in fluid communication with the first and second source of pressurized fluid, the first source taking up any lash associated with the engine, the second source causing the second valve actuator to open the valve." In contrast, Nakamura does not disclose or even suggest any such elements.

Referring to FIG. 1, Nakamura is directed to an engine control system for a construction machine. Nakamura discloses two hydraulic pumps 1 and 2 that are connected to actuators 5 and 6 through a flow control valve 3. The actuators 5 and 6, for example, actuate a swing arm, boom or an arm of an excavator. The actuators 5 and 6 and the hydraulic pumps 1 and 2, which power the actuators 5 and 6, in no way actuate an engine valve that extends from an engine cylinder.

Accordingly, Nakamura does not disclose or even suggest a first valve actuator and a second valve actuator, both of which actuate a valve reciprocatingly disposed in a port extending from the engine cylinder. Additionally, Nakamura fails to disclose or even suggest a first source of pressurized fluid taking up lash associated with the engine and a second source of pressurized fluid causing the second valve actuator to open the valve. Because Nakamura does not disclose or even suggest each and every element recited in claim 17, claim 17 is patentable over Nakamura. Therefore, the rejection of claim 17 and claims 18-24 depending therefrom, should be withdrawn.

Claims 25-34 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Hu, U.S. Pat. 5,839,453 (Hu). Applicants traverse this rejection.

Claim 25 recites a method of controlling an engine comprising providing a fluidically driven valve actuator operatively associated with the valve, and opening the valve during the compression stroke using the fluidically driven actuator. Hu fails to disclose or even suggest such elements.

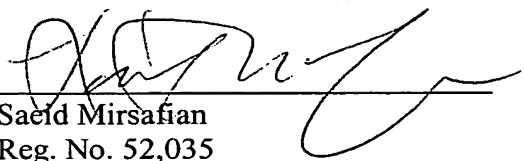
Hu is directed to a system for providing lost motion in the actuation of an engine valve. Referring to FIG. 8 of Hu, the rocker arm 130a includes a hydraulic circuit 64 that can be closed to impart the motion of the cam 40a to the valve 30a. A valve 100 can vent the hydraulic fluid from the circuit 64 to partially or completely suppress the transfer of motion

from the cam 40a to the valve 30a. Therefore, the hydraulic circuit 64 is not a hydraulic valve actuator. Additionally Hu does not disclose or even suggest that the hydraulic circuit 64 is capable of independently actuating the valve. In fact, because the hydraulic fluid in the hydraulic circuit 64 is under low pressure, the circuit 64 is incapable of independently actuating the valve 30a.

Based on the foregoing, Hu does not disclose or even suggest providing a fluidically driven valve actuator operatively associated with the valve, and opening the valve during the compression stroke using the fluidically driven actuator. Because Hu does not disclose or even suggest each and every element recited in claim 25, claim 25 is patentable over Hu. Therefore, the rejection of claim 25 and claims 26-34 depending therefrom, should be withdrawn.

In view of the foregoing, the above-identified application is in condition for allowance. In the event there is any remaining issue that the Examiner believes can be resolved by a telephone conference, the Examiner is respectfully invited to contact the undersigned attorney at (312) 474-6639.

Respectfully submitted,



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